

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listing of claims in the application.

Listing of Claims

Claim 1 (currently amended): A pulsed laser diode driver comprising:

- a slow voltage discharge stage comprising a first capacitive energy storage element ~~chargeable to a first voltage magnitude and~~ having a first energy storage capacity and being operatively charged to a first voltage magnitude;
- a fast voltage discharge stage comprising a second capacitive energy storage element ~~chargeable to a second voltage magnitude and having a second energy storage capacity, the second energy storage capacity being less than the first energy storage capacity, and~~ being operatively charged to a the second voltage magnitude ~~being greater than the first voltage magnitude~~;
- a switch-controlled circuit path; and
- a laser diode controllably coupled through the switch-controlled circuit path to the first capacitive energy storage element for operatively receiving a discharge of energy therefrom, and to the second capacitive energy storage element for operatively receiving a discharge of energy therefrom.

Claim 2 (currently amended): The pulsed laser diode driver of claim 1 further comprising a first charge source for establishing the first magnitude voltage, and a second charge source for establishing the second magnitude voltage, wherein:

the first capacitive energy storage element is a first capacitor coupled to the first charge source;

the second capacitive energy storage element is a second capacitor coupled to the second charge source;

the switch-controlled circuit path comprises a switch having a first terminal coupled to a first terminal of the laser diode, and a second terminal coupled to a first terminal of the first capacitor and to a first terminal of the second capacitor; and

a second terminal of the laser diode is coupled to a second terminal of the first capacitor and to a second terminal of the second capacitor.

Claim 3 (original): The pulsed laser diode driver of claim 2 wherein the first terminal of the switch is grounded.

Claim 4 (original): The pulsed laser diode driver of claim 2 wherein:

the first terminal of the switch is not grounded; and

the second terminal of the switch is not grounded.

Claim 5 (currently amended): The pulsed laser diode driver of claim 1 further comprising a first charge source for establishing the first magnitude voltage, and a second charge source for establishing the second magnitude voltage, wherein:

the first capacitive energy storage element is a first capacitor coupled to the first charge source;

the second capacitive energy storage element is a second capacitor coupled to the second charge source;

the switch-controlled circuit path comprises a first switch and a second switch, the first switch having a first terminal coupled to a first terminal of the laser diode and a second terminal coupled to a first terminal of the first capacitor, and the second switch having a first terminal coupled to the first terminal of the laser diode and a second terminal coupled to a first terminal of the second capacitor; and

a second terminal of the laser diode is coupled to a second terminal of the first capacitor and to a second terminal of the second capacitor.

Claim 6 (original): The pulsed laser diode driver of claim 5 wherein:

the first terminal of the first switch is grounded; and

the first terminal of the second switch is grounded.

Claim 7 (currently amended): The pulsed laser diode driver of ~~claim 2 wherein~~
claim 5 wherein:

the first terminal of the first switch is not grounded;

the second terminal of the first switch is not grounded;

the first terminal of the second switch is not grounded; and

the second terminal of the second switch is not grounded.

Claim 8 (original): The pulsed laser diode driver of claim 1 wherein the switch-controlled circuit path comprises a first switch having a floating terminal and a second switch having a grounded terminal, the floating terminal of the first switch being coupled to a first terminal of the laser diode, and the grounded terminal of the second switch being coupled to a second terminal of the laser diode.

Claim 9 (original): The pulsed laser diode driver of claim 1 wherein the switch-controlled circuit path comprises at least one switch that comprises a single switch device, a series circuit of individual switch devices, a parallel circuit of individual switch devices, or any combination of the foregoing.

Claim 10 (currently amended): The pulsed laser diode driver of claim 1 wherein the first capacitive energy storage element comprises a capacitor, a capacitor contained in a pulse forming network, a capacitor coupled to a battery, a capacitor coupled to a fuel cell, an array of one or more of the foregoing, or any combination of the foregoing.

Claim 11 (currently amended): The pulsed laser diode driver of claim 1 wherein the second capacitive energy storage element comprises a capacitor, a capacitor contained in a pulse forming network, a capacitor coupled to a battery, a capacitor coupled to a fuel cell, an array of one or more of the foregoing, or any combination of the foregoing.

Claim 12 (original): The pulsed laser diode driver of claim 1 wherein the laser diode comprises a single laser diode device, an array of laser diode devices connected in series, an array of laser diode devices connected in parallel, or any series or parallel connection of the of the foregoing.

Claim 13 (currently amended): The pulsed laser diode driver of claim 1, further comprising:

an additional fast voltage discharge stage comprising a third capacitive energy storage element having a ~~third energy storage capacity at a third voltage magnitude~~, the third capacitive energy storage capacity being less than the second capacitive energy storage capacity, and being operatively charged to a ~~the~~ third voltage magnitude ~~being~~ greater than the second voltage magnitude;

the laser diode being controllably coupled through the switch-controlled circuit path to the third capacitive energy storage element for operatively receiving a discharge of energy therefrom, as well as to the first capacitive energy storage element and to the second capacitive energy storage element ~~through the switch-controlled circuit path~~.

Claims 14–17(canceled)

Claim 18 (currently amended): ~~The A method of claim 14 further~~ for driving a laser diode with a current pulse, comprising:

establishing a first voltage magnitude in a first energy storage element having a first energy storage capacity;

establishing a second voltage magnitude in a second energy storage element having a second energy storage capacity, the second energy storage capacity being smaller than the first energy storage capacity, and the second voltage magnitude being greater than the first voltage magnitude;

discharging the first energy storage element and the second energy storage element into a laser diode, the discharge of the first energy storage element essentially furnishing a flattop current pulse to the laser diode, and the discharge of the second energy storage element essentially establishing a risetime characteristic of the current pulse;

establishing a third voltage magnitude in a third energy storage element having a third energy storage capacity, the third energy storage capacity being smaller than the second energy storage capacity, and the third voltage magnitude being greater than the second voltage magnitude; and

discharging the third energy storage element into the laser diode, the discharge of the third energy storage element essentially establishing the risetime

characteristic of the current pulse along with the discharge of the second energy storage element.

Claim 19 (canceled)

Claim 20 (currently amended): ~~The A~~ pulsed laser diode driver ~~of claim 19~~
further comprising:

means for establishing a first voltage magnitude in a first energy storage element having a first energy storage capacity;

means for establishing a second voltage magnitude in a second energy storage element having a second energy storage capacity, the second energy storage capacity being smaller than the first energy storage capacity, and the second voltage magnitude being greater than the first voltage magnitude;

means for discharging the first energy storage element and the second energy storage element into a laser diode, the discharge of the first energy storage element essentially furnishing a flattop current pulse to the laser diode, and the discharge of the second energy storage element essentially establishing a risetime characteristic of the current pulse;

means for establishing a third voltage magnitude in a third energy storage element having a third energy storage capacity, the third energy storage capacity being smaller than the second energy storage capacity, and the third voltage magnitude being greater than the second voltage magnitude;
and

means for discharging the third energy storage element into the laser diode, the discharge of the third energy storage element essentially establishing the risetime characteristic of the current pulse along with the discharge of the second energy storage element.

Claim 21 (new): The pulsed laser diode driver of claim 1 wherein the switch-controlled circuit path comprises a closing switch.

Claim 22 (new): The pulsed laser diode driver of claim 1 wherein the switch-controlled circuit path comprises a closing switch for controllably discharging energy to the laser diode from the first capacitive energy storage element and from the second capacitive energy storage element.

Claim 23 (new): The pulsed laser diode driver of claim 1 wherein the switch-controlled circuit path comprises:

a first closing switch for controllably discharging energy from the first capacitive energy storage element to the laser diode; and

a second closing switch different than the first closing switch for controllably discharging energy from the second capacitive energy storage element to the laser diode.